13MAY1947

PROCEEDINGS

OF THE

Bournemouth Natural Science Society.

VOL. XXXVI.

SESSION 1945-46.

Price - Two Shillings

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PUBLISHED BY THE SOCIETY AT ITS HOUSE,
39 CHRISTCHURCH ROAD, BOURNEMOUTH, 1947.

Bournemouth Guardian, Ltd., 194-196, Commercial Rd.

CONTENTS

	Page
Introductory Note	3
Officers and Council, 1946-1947	4
Committees	5
Council's Report, 1946	6
Summary of Accounts	8
Summary of Lectures and Excursions	11
Library Report	11
Museum Report	12
Garden Report	12
Reports of Sections	13-16
"Man as a Fossil Animal," by Henry Bury, M.A., F.L.S., F.G.S. ...	17
Obituary—Dr. Aitcheson Robertson	26

BRITISH MUSEUM NATURAL HISTORY

Introductory Note.

The objects of the Society are declared by the second of its rules to be "the promotion of the study of Science in all its branches, by means of Lectures, Field Meetings, the Reading and Discussion of Papers, and the formation of Sections of its members devoted to any particular branch of the Society's work, and in any way that the Council of the Society shall deem advisable."

The Sections at present working are as follows:— **Archæological and Historical, Astronomical, Botanical, Entomological, Geographical, Geological, Microscopical, Photographic, Physical, and Zoological.**

During the **Winter Session,** from October to April, GENERAL and SECTIONAL MEETINGS are held, comprising Lectures and Demonstrations on subjects of scientific interest, illustrated by lantern slides, diagrams, specimens or experiments.

All meetings are open to all members of the Society.

Throughout the **Summer Session,** EXCURSIONS to places of interest in the neighbourhood are arranged, and indoor or garden meetings occasionally held.

The management of the Society is vested in a Council, which is elected at the Annual General Meeting, held in October.

The Society possesses a Library available for the use of members. This is yearly becoming more extensive and valuable by the acquisition of standard text books and of books dealing with matters of local scientific interest. Books may, under certain conditions, be borrowed by members, and there is a Reading Room in which works of reference may be consulted.

Members are elected by the Council and pay an annual subscription of £1 for full membership (admitting to all meetings and excursions for the year), a subscription of £2 covers four adult members of the same family residing in the same house.

Notices, giving full details of all meetings, etc., are posted to every member, and a volume of Proceedings is published each year.

Application Forms for Membership, and further particulars, can be obtained from the

Assistant Secretary,
Miss K. HUNKIN, B.A.,
25, Foxholes Road,
Southbourne,
Bournemouth.
Tel. Southbourne 1507

Bournemouth Natural Science Society

OFFICERS AND COUNCIL FOR 1946-47.

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Deputy-Chairman of Council

J. F. N. GREEN, B.A., F.G.S.

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Astronomical: INSTR.-CAPT. M. A. AINSLIE, R.N., B.A., F.R.A.S.
Botanical: E. CHAMBERS.
Entomological: S. C. S. BROWN, L.D.S., R.C.S., H.D.D.
Geographical: F. L. LOWTHER, B.A., M.B.O.U.
Geological: HENRY BURY, M.A., F.G.S., F.L.S.
Microscopical: S. R. WYCHERLEY, F.R.M.S.
Photographic: E. A. ROBINS, F.R.P.S., F.L.S., F.R.M.S.
Physical: W. J. WOODHOUSE, A.C.P.
Zoological: MRS. W. BOYD WATT, M.B.O.U., F.Z.S.

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W. J. WOODHOUSE, A.C.P.
29, Twynham Road, Southbourne. Tel. Southbourne 1199.

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Chairman of Botanical Section: E. CHAMBERS.

Chairman of Entomological Section: S. C. S. BROWN.

Chairman of Geographical Section: F. L. LOWTHER.

Chairman of Geological Section: H. BURY.

Chairman of Zoological Section: MRS. BOYD WATT.

E. ST. J. BURTON, MISS CHILD, F. WILLIAMSON.

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Chairman-Hon. Editor: MISS M. PENROSE.

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Garden:

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Chairman of Botanical Section: E. CHAMBERS.

B. GORTON, R. WATKIN (Hon. Sec.), MISS E. WHITAKER, F. WILLIAMSON.

Entertainment:

Chairman: MRS. I. SIMMONS.

MISS PARNELL JONES, F. L. LOWTHER, MISS E. RODEN, H. G. SADLER, MISS I. SHEFFIELD, W. J. WOODHOUSE, MRS. VICKERS.

Council's Report for the year ending 30th September, 1946.

The Council has pleasure in informing the members of the Society that membership has again risen slightly—to 411 as compared with 394 at the end of September, 1945. 87 (new) members have joined, 44 have resigned, and 7 have died. Unfortunately 29 members have failed to keep up their subscriptions and have therefore been removed from the list of members. There are now 11 honorary members of the Society, 7 life members, and 8 associates. The Society still has two of its original members.

In October, 1945, the Council and the Society suffered a very grievous loss in the death of Mr. L. Beeching Hall. It is unnecessary to add here to the obituary notice published in the Proceedings last year, except to record the debt of gratitude owed to Mr. Hall by the Society for the work which he did for it during so many years.

The Council has also the unpleasant duty of recording the deaths of the following members:—Mrs. Bigg (a Life member), Mr. H. Haines, Dr. Pugh, Mr. Story, Mr. Warlow.

There have been a considerable number of changes among the officers of the Society during the past year. In December, Mr. William C. Simmons resigned the Hon. Curatorship which he had held since 1937. Mr. J. F. N. Green was elected in his stead.

Members will probably have already heard with very much regret of the illness of Mr. Whitaker, who was obliged to resign his 16 years Chairmanship of the Photographic Section in April, and his office of Hon. Librarian which he had held since 1936, in September. Members will certainly wish to join the Council in expressing the sincere hope that he will soon be making progress towards recovery. In July, Mr. E. A. Robins succeeded him as Chairman of the Photographic Section, thereupon resigning the Chairmanship of the Microscopical Section. As Chairman of the latter Section, the Council has appointed Mr. S. R. Wycherley.

In September, Mr. F. Broad resigned his positions of Hon. Secretary and Hon. Auditor owing to ill-health. It should be recorded that in addition to his work in these two offices, Mr. Broad had been doing much invaluable work in the Library, for all of which the Council is very grateful. Mr. W. J. Read has been elected Hon. Secretary and Mr. H. Barker, Hon. Auditor. The second of the Hon. Auditors has resigned since the appointment of Mr. Barker, Mr. MacMichael being unable to continue in office after the end of September, and the Council has not yet appointed his successor.

In addition to the Annual Meeting and the Presidential Address, there have been 13 General and 55 Sectional Meetings, while excursions have totalled 41.

Motor excursions have made a welcome re-appearance; three were arranged by the Archæological and Historical Section and

were very well attended. It is hoped that it will be possible to arrange many more next year.

The Presidential Address, "The History of the Bourne and its Valley," was delivered by the President, Mr. J. F. N. Green, B.A., F.G.S., on Saturday, November 3rd, 1945.

As President for 1946-47, the Council has had the very great honour of obtaining Lieut.-Col. C. D. Drew, D.S.O., F.S.A. Colonel Drew is well known to members of the Society as an archæologist of wide repute, and his Presidential Address on the Manors of the Iwerne Valley, Dorset, will be looked forward to with great interest

The Entertainment Committee has maintained its record of highly successful meetings. The New Year Party held on January 5th, and the Garden Party on September 14th, were particularly well patronised and immensely enjoyed. These, with the Whist Drive held on March 30th, have raised a total amount for the Society's funds of over £63—a result of which the Committee may indeed be proud. The Council wishes to record its thanks to Mrs. I. Simmons and to the members of the Committee for all the hard work which they have put in during the year. It is hoped that the Committee will continue its essential work in the future.

Another very welcome addition to the Society's funds has been provided by the Hon. Curator, Mr. Green, who has raised a very considerable sum by the sale of surplus articles from the Museum. The Council wishes to thank Mr. Green for this and for his excellent re-arrangement of the collections.

The Garden Committee, under the Chairmanship of Mr. H. G. Sadler, has worked very hard throughout the year, and, with the assistance of the gardener, has brought back to the garden much of its pre-war tidiness. Members of the Committee have put in a great deal of very hard work and deserve the sincere thanks of the Council and the Society.

The thanks of the Council are also due to the Hon. Editor, Miss M. Penrose, for her excellent work in producing the last year's Volume of the Proceedings.

The Society's premises were let for a week in the summer to a Summer School, and the hall and garden were let on several other occasions for garden parties and conferences.

The year has brought many gifts to the Library and Museum, and the Council appreciates very highly the generosity of the donors. One very valuable gift by a member who wishes to remain anonymous, was a microphone for the lecture-hall. This is proving a benefit to all members and especially to those who suffer from deafness.

The Council wishes also to present its very hearty thanks to the Tea Committee, now under the Chairmanship of Miss Parnell-Jones, for its continued successful work.

Those members who have acted as lanternists for the lectures, as well as those who helped in the distribution of the Proceedings, are also entitled to the gratitude of the Council and of the Society.

Summary of the Accounts for the Year ending 30th September, 1946.

CURRENT ACCOUNT.

Receipts.

	£	s.	d.	£	s.	d.
Annual Subscriptions to Sept., 1946	325	5	0			
Ditto on A/c, Sept., 1947 ...	14	10	0			
				339	15	0
Donations:—						
Special Gift to Asst. Secretary's Salary	35	0	0			
Individual Donations	11	2	0			
Collection for National Trust ...	2	0	0			
Entertainment Committee:—						
New Year Party (*less* expenses)	21	11	10			
Whist Drive (*less* expenses) ...	5	15	0			
Garden Party (*less* expenses) ...	36	6	6			
				111	15	4
Rents from Tenants	142	10	0			
Wessex Adult School	1	8	6			
Hire of Hall (private) ...	1	5	0			
Hire of Hall W.E.A.	1	10	0			
Hire of Hall United Nations ...	1	10	0			
Summer School	10	0	0			
				158	3	6
Proceeds of Teas (Tea Committee)	7	9	10			
Proceeds of Excursions	5	2	3			
				12	12	1
Visitors to Lectures	0	11	0			
Sale of Surplus	37	6	1			
Extra Gas and Meetings, R.E. Society	2	5	0			
Testimonial to Caretaker (collection)	30	18	0			
Return of B.O.U. Subscription ...	0	10	0			
				71	10	1

Payments.

	£	s.	d.	£	s.	d.
Interest on Debentures due 1st Sept., 1946	156	16	6			
Less Tax—Half-year @ 10/- and Half-year @ 9/-	74	18	9			
				81	17	9
Income Tax, Schedule D ...				2	0	0
Corporotion Duty				3	19	0
Maintenance:—						
Property Tax, Schedule A ...	102	10	0			
Rates	97	7	6			
Water	3	13	6			
Gas	17	5	4			
Electricity	9	3	4			
Fuel (Coal, Coke, etc.) ...	18	5	3			
Insurance (property)	20	0	3			
Caretaker's Wages and Insurance	69	12	6			
Garden—Wages and Insurance ...	24	6	9			
Telephone	10	0	8			
Supply Caretaker	5	0	0			
Repairs	21	2	2			
Sundries	1	12	4			
				399	19	7
Secretarial Expenses:—						
Salary and Insurance	43	15	1			
Postages	11	10	2			
Printing and Stationery ...	34	2	10			
Printing Proceedings	25	6	0			
				114	14	1
Subscriptions to other Societies:—						
National Trust (collection) ...				2	0	0
Trust for Ornithology (2 years)				1	0	0
South Eastern Union ...				1	1	0

Cash Balance forward from 1945 ...	99	4	1		Presentation to Caretaker (*less* expenses)			30	10	6
Petty Cash brought forward ...	5	0	5		Cash Balance:—					
			104	4	6	Current Account	155	8	3	
						Petty Cash in hand	5	10	4	
								160	18	7
						Deposit A/c, General Fund £109 8s. 1d.				
			£798	0	6			£798	0	6

We have examined the above accounts with the books of the Society and the vouchers for payments and certify the same to be correct.

ERNEST McMICHAEL.
HERBERT H. BARKER.

Bournemouth, 25th November, 1946.

DEPOSIT ACCOUNTS.

Debenture Fund.	£	s.	d.		£	s.	d.
Balance brought forward	42	17	3	Balance on Deposit	43	4	5
Interest to December, 1945	0	7	2				
	£43	4	5		£43	4	5

Building Fund.	£	s.	d.		£	s.	d.
Balance brought forward	34	17	3	Balance on Deposit	35	3	3
Interest to December, 1945	0	6	0				
	£35	3	3		£35	3	3

Archæological Research Fund.	£ s. d.		£ s. d.
Balance brought forward	10 9 8	Balance on Deposit	10 11 5
Interest to December, 1945	0 1 9		
	£10 11 5		£10 11 5

Redemption Fund.	£ s. d.		£ s. d.
Balance brought forward	14 3 7	Balance on Deposit	14 4 6
Interest to December, 1945	0 0 11		
	£14 4 6		£14 4 6

Bournemouth Trustee Savings Bank General Fund.	£ s. d.		£ s. d.
Balance brought forward	106 15 1		
Interest to 20/xi/45	2 13 0	Balance on Deposit	109 8 1
	£109 8 1		£109 8 1

Note.—

The special thanks of the Society are due to the following:—

(a) An anonymous donor for **£35** towards the Salary of the Assistant Secretary.

(b) The Entertainment Committee and the Tea Committee.

(Signed) WILLIAM J. WOODHOUSE,
Hon. Treasurer.

30th September, **1946.**

SUMMARY OF MEETINGS AND EXCURSIONS.

General.—Two Meetings, twelve Club Days, a New Year Party in January, a Whist Drive in March and a Garden Party with Dramatic Entertainment in September.

Archæological and Historical Section.—Eleven Meetings and three Excursions.

Astronomical Section.—Three Meetings.

Botanical Section.—Three Meetings and one Excursion.

Entomological Section.—One Meeting and three Excursions.

Geographical Section.—Seven Meetings and six Excursions.

Geological Section.—Three Meetings and one Excursion.

Microscopical Section.—Eleven Meetings.

Photographic Section.—Two Meetings.

Physical Section.—Three Meetings.

Zoological and Biological Section.—Ten Meetings and one Excursion .

Combined Sectional Meetings and Excursions. — Botanical and Zoological Sections, twenty-four Excursions. Archæological and Botanical Sections, two Excursions.

Library Report.

Gifts of books were received from:—Mrs. Beeching Hall, Mrs. Crallan, Mr. J. F. N. Green, Mr. Scarsdale Brown and Dr. Manley, and of periodicals from:—Mrs. and the Misses Penrose, Mrs. Boyd Watt, Mr. Bury, Lt.-Colonel Fraser, Mr. J. F. N. Green, Mr. Hemmy, Mr. Mummery and Dr. Fountain.

A 1st. Edition set of Sowerby's Botany was sold by the Society to Messrs. Wheldon and Wesley.

During the latter part of the year the work of the Library was carried on by volunteers owing to the illness of the Librarian, Mr. Whitaker. Resignations, owing to ill-health, were received from Mr. Whitaker and Mr. Broad, with much regret.

Mr. W. J. Read, Hon. Secretary, has undertaken the reorganisation of the Library, which will result in the assembling, on the same or adjacent shelves, of all books on the same subject, or, where the subject is a large one, of all books on the same branch of a subject. The work has been facilitated by the transferring to the Reference Library of sets of bound volumes of "Nature" and other periodicals. Additional shelves have been fixed in the Reference Library for the accommodation of the volumes in question.

Pending the appointment of an Hon. Librarian, vice Mr. Whitaker, the undersigned has undertaken the duties pro tem.

(Signed) H. G. SADLER,

Acting Hon. Librarian.

Museum Report.

During the year 1946 the chief work of the Museum has been to take stock of and to arrange the large amount of gifts received during the war. The Council decided that, in order to relieve congestion, which had become serious, duplicates and material not of scientific value schould be disposed of. Good progress has been made in weeding and bringing up to date the herbarium and the collections of birds, insects, tropical shells, minerals and rocks.

It is only possible to mention some of the more important additions made during and since the war. Fifty stuffed birds were received from various donors, including a fine series, well documented, from Lord Malmesbury, among which was the first recorded British specimen of White's thrush. Sixteen cases of mounted birds' nests, notably artistic, were given by Mr. V. J. Adams. A large collection of shells, made by Dr. J. McBean, was received from Miss McBean. Colonel F. E. Fraser presented an excellent series of British dragon-flies. Numerous minerals from Dr. Crallan included specially fine examples of fluor-spar. A set of Bracklesham fossils from the King George V graving dock at Southampton came from Mr. E. St. J. Burton. The Council decided to offer to the Bristol Museum a collection of bones from the Clevedon cave, received from Miss Male. The gift was much appreciated. Among other donors were Mrs. Brown, Mr. H. Bury, Mr. J. B. Calkin, Mr. O. Ellum, Miss Green, Mrs. Beeching Hall, Mrs. Insch, Miss Jourdain, Miss Kirke, Miss McCance, Mrs. Sanderson, Mrs. Saxten, Mr. N. D. Simpson, Mrs. Quick, Mr. T. E. Waltham and the Curator.

Much help has been given by the chairmen of sections. Miss Child and Mr. Williamson have brought order into the bird collection. Mr. Baker and Mr. Waltham have given freely of their skill.

(Signed) J. FREDK. N. GREEN,
Hon. Curator.

Garden Report.

October, 1946.

When the present Garden Committee was elected the garden was in a bad state due to the unavoidable neglect during the war years.

Shrubs and trees had overgrown and were badly in need of pruning.

Weeds were flourishing everywhere except in the bed of which the Caretaker had taken charge.

The lawn had been cut only at long intervals and the grass had seeded, the wind spreading the seeds over all the beds.

The first work taken in hand by the Committee was the pruning of the shrubs and clearing the undergrowth as much as possible, and a great deal of work was done in this effort.

The provision of a visit each week by a regular gardener has resulted in the lawn being restored to a decent condition, and the grass verges to the beds being regularly attended to, and thus the spread of the grass seeds was stopped.

The gardener has also spent much time in clearing up the accumulation of leaves and rubbish amongst the east and west boundary beds, and tidying up generally; also burning the piles of rubbish at the back of the garden. He has also done much digging over of the beds.

The members of the Committee themselves have done much work digging, clearing and weeding. Part of the roadside bed has been cleared of weeds, dug over, limed, and planted with a nice collection of Flag Irises, which seem to be doing well. The long flower-bed along the east side of the lawn presented many problems. It had been largely overrun by seedling Lupins and a very inferior but strong growing Michaelmas Daisy, and the first work to be done consisted in clearing out the latter and reducing the Lupins to a few clumps. It was then found that many of the original occupants of the bed had been smothered by these rampant growers. The bed was then dug over and weeded, and as many as possible of the original plants recovered and re-planted with the addition of various gifts of perennials.

Unfortunately grass seeds from the lawn keep on germinating and require fresh weedings; also the wet season made weed growth rampant and stopped work temporarily.

However, it is hoped to overcome these troubles before next flowering season arrives, when hoeing will keep the weeds down without much trouble.

The Heath Bed has been dug over several times. Messrs. Pritchard, who had originally presented the collection of Heaths, were approached with the suggestion that they might see their way to replace the lost plants. They replied very cordially that they regretted that at present their stocks were too low.

The Committee has gratefully received many gifts of shrubs and perennials from members and friends, including Azaleas, Dwarf Michaelmas Daisies, Korean and Rubellum Chrysanthemums, Irises, Erigerons, etc.

H. G. SADLER, Chairman.
R. WATKIN, Hon. Sec.

Botanical Report

Although much interfered with by rain and flooding, the year's Botanical Excursions had very satisfactory results in lists of Flowering Plants, and two unusual additions were made by

individual members—Miss K. M. Chilver leading to her find of Lathyrus Nissolia (Crimson or Grass Vetchling) near Queen's Park, and Mrs. Boyd Watt showing Leonurus Cardiaca (Common Motherwort) from near Fordingbridge. The Fungus Forays were very successful and much interest is again being taken in the esculent forms. Another rare species of Geaster—the black G. limbatus—was found near Brockenhurst.

During the year there have been 182 additions to the Herbarium, 110 per Mr. Simpson (including many from the late Mr. Beeching Hall's collection) and 72 transferred from the Rayner herbarium, etc.

Acting on the suggestion kindly made by Mr. D. W. Young (Deputy Superintendent of the New Forest), our Society has provided an Advisory Committee who will be notified of any development by cultivation or drainage and be able to help in the preservation of the New Forest wild flora.

Mention must be made of the Excursion to the Experimental Plots and Plantations at Sugar Hill, Wareham, where Dr. Rayner and Prof. Neilson Jones kindly received the Section and demonstrated the results of the symbiotic growth of Boletus bovinus and other Fungi with Conifers and other trees. The opportunity of seeing the development of the Mycorrhizas, and the resulting growths which prove their economic importance, made the excursion one of outstanding value.

(Signed) E. CHAMBERS,
Chairman.

Geographical Report.

Excursions were conducted by the Chairman up the Bourne Valley from Coy Pond, when the surface features were explained in detail and the importance of the Plateau Gravels emphasised in providing building material and in preserving evidence of the Antiquity of Man.

A visit to the Old Well House at Branksome Dene gave rise to a warm discussion on the origin of the mysterious tunnel with its two branches. Its connection with smuggling activities was, however, discounted.

A ramble to Coward's Marsh had been planned, but was not practicable owing to floods. Mr. W. G. Smith substituted a walk round St. Catherine's Hill, which was much appreciated. Mr. E. Baker again led a party down the valley from Stonydown Plantation to Corfe Mullen and the Brickworks at Knole. Mr. Lowther with the help of coloured maps, pointed out the drainage and the excellent water supply which was reflected in the industries of the district.

Much valuable research has been carried out in the Holdenhurst district by Miss K. Chilvers, who has devoted her spare time to tracing old industries. She has also made artistic sketches in water-colours of farmsteads and buildings at Muscliff. The results are not only impressive but will be invaluable in any future survey of that portion of the borough and of the villages along the Stour Valley.

F. L. LOWTHER, 21/11/46.

Entomological Report.

Summary of observations on Insects in the Bournemouth area during 1946.

While 1945 was remarkable for the large number of rare migratory insects seen in this country, 1946 will go down as a year in which insects in general and migrants in particular were scarce. The cold and wet spring and summer being no doubt the determining cause.

The Bath White Butterfly (Pieris daplidice), a very rare migrant, was seen in this country in 1945 in hundreds, but quite failed to establish itself as it has not been observed this year.

Of our resident species, the White Admiral, at one time mainly confined to the New Forest, has been steadily increasing its range throughout the Southern Counties, and has now been reported from Leicester.

Another butterfly, the Speckled Wood, at one time local and restricted to woods, has likewise showed a marked increase in its range and is common even in the centre of Bournemouth.

(Signed) S. C. S. BROWN,
Chairman.

Zoological Report.

During the year twenty-seven excursions have been made jointly with the Botanical Section, and three visits to Stanpit, under the guidance of Miss C. Popham. Eight Lectures have been given, including one by a guest-lecturer, Miss Clemence M. Acland, F.Z.S., M.B.O.U., on "A Naturalist's Holiday in the Faroe Isles," illustrated by lantern slides. Zoological lectures which, owing to printing restrictions, could not be included in the the Society's "Transactions," have been recorded in typescript. These have been bound up and presented to the Library.

The "British Birds" Reading Circle, inaugurated in 1942, continues to flourish. The monthly parts of the periodical are bound up at the end of the year and presented to the Library.

The efforts of members of the Section to create and maintain a sanctuary for wild birds at Stanpit Marsh received a severe shock in recent proposals before the Christchurch Town Council for the artificial development of the Marshes as a pleasure ground. Immediate action was taken and it is hoped that these proposals will be withdrawn.

Meetings of the New Forest Advisory Committee on birds, held at Lyndhurst, under the secretaryship of Miss Popham, have been attended by the Chairman of the Section.

Miss C. Popham, the Society's Bird Recorder, sends the following notes :—

BIRD NOTES.

On the morning of November 7th I picked up five dead and one dying gull on the mud at low tide at the bottom of our garden : not a mark or wound of any sort visible. All were warm and just dead. Later, on the same morning, on the Stanpit Marshes, about a quarter of a mile away, I found four more gulls dead, and one Herring gull dying. This bird I put out of its misery. All the gulls, with this exception, were black-headed. Next morning I found four more Black-headed in the same condition, i.e., dead, and no mark or wound. This made 15 in all. In November I watched many Black-headed gulls diving for food in the Run at Mudeford. Some birds went right under, like Terns. The majority only immersed the head and body. I have seen a gull dive and be totally immersed.

From South-Eastern Bird Report.

From "The South-Eastern Bird Report," being an account of Bird life in Kent, Surrey, Sussex and Hampshire, published under the auspices of the South-Eastern Union of Scientific Societies.

To be obtained from the Editor, Ralph Whitlock, F.Z.S., M.B.O.U., Webb's Farm, Pitton, Salisbury, Wilts (price 5/-).

Further records are held up during Miss Popham's unexpected visit to Switzerland.

WINIFRED BOYD WATT,
Chairman.

Man as a Fossil Animal.

(From a Lecture given by Henry Bury, M.A., F.G.S., F.L.S., December 5th, 1946.)

The extreme rarity of the fossil remains of man has surprised many people, and has even been put forward as an argument against his evolution; but the truth is that the remains of animals are seldom preserved as fossils, unless they are buried in a favourable soil soon after death; and that rarely happens with land animals. A few may be carried away by floods, and buried in river deposits, but animals living on the upland plains and in forests, as the ancestors of man and the apes did, are very rarely so buried: their bones lie out on the surface, and soon crumble away. Up to the present no bones of man have been found in any strata older than the Pleistocene, but we shall endeavour to trace his ancestry back into the Tertiary Period. A considerable number of skeletons have been found in continental caves, especially in France; but all of them down to the bottom of the Aurignacian culture (Upper Pleistocene) belong to the existing species of man, Homo sapiens, and therefore tell us nothing of his ancestry: yet they are interesting for several reasons; firstly because they show that man has existed without serious bodily change for something like 80,000 years; secondly because most of them were buried with great care, with all their tools round them; from which it is reasonable to infer that the men of that period believed in a future life, in which those tools would be required. Sometimes also food was provided. Thirdly they are interesting because some of them were very skilful artists.

Homo sapiens then existed as far back as the Aurignacian; but if we go below this, into the Mousterian layer, we find, though still in the Upper Pleistocene, the bones of men who differed widely from Homo sapiens. They are called Neanderthal men, from the place where they first attracted attention; and they, too, buried their dead with care. Without going into details of the many peculiarities of the skull, I will draw attention to three points in which it comes nearer to the apes than to modern man. Firstly there is a strong bony ridge across the forehead, which we find in the gorilla and chimpanzee, but not in any living men; secondly there is a complete absence of a chin; and thirdly the forehead is sloping, and the vault of the skull very low. The skull in some specimens was enormous, and the brain larger than in most modern men; but other Neanderthal skulls are much smaller. Bones of this species of man have been found in many European countries, including Russia (Crimea); and in Asia, in Siberia and in Palestine. In Europe this is the only form of man so far found at the Mousterian level; but in the caves of Mount Carmel two races are present, one short, one tall. The short race is of Neanderthal type, though probably earlier than those of

Western Europe, but the tall race is very near Homo sapiens in many respects, differing mainly in having heavy brow-ridges, and Sir Arthur Keith thinks that this type of man is the forerunner of modern Europeans; but Dr. Zeuner is convinced that Homo sapiens was already in existence in the Middle Pleistocene, and he regards the tall men of Mount Carmel as hybrids—crosses between Homo sapiens and Neanderthal man. The evidence for the existence of the modern type of man in the Middle Pleistocene will be given directly; but attention may be called here to a skull recently found in South-West Australia. According to our present information, its geological position shows it to be of the same age as the Mousterian industry in Europe; yet it is Homo sapiens, and nearer to the modern Australian native than to a European. If these facts are confirmed, then the modern type of man was not only in existence at the same time as Neanderthal man, but had already travelled far afield, for we cannot suppose that he originated in Australia. This is not the only Pleistocene skull found in Australia, though how they got across from Asia at so early a period is still a mystery.

We now turn to the Middle Pleistocene. The stone implements known as Acheulean, which are typical of this period, are found with remarkable similarity of forms, in Europe, Africa (Egypt to the Cape), and in India, but authentic bones of that period are extremely rare. They have been reported from time to time, but in almost every case they have lain near the surface and may be due to burials at a much later date. In one case, however, their antiquity is beyond all doubt. In 1935 Mr. Marston, a dentist, found a portion of a human skull in a gravel pit at Swanscombe, in the Thames Valley; and since it lay twenty-four feet below the surface, there could be no question of a recent burial. Some months later, in 1936, Mr. Marston found a second portion of skull, a few yards away from the first, but at the same level; and when the two portions were brought together, they fitted perfectly, and were clearly parts of the same skull. All the parts preserved of this "Swanscombe skull" correspond exactly with Homo sapiens, but unfortunately the forehead is missing, and so we cannot say positively that it did not possess prominent brow-ridges. It closely resembles the Piltdown skull in many ways, and since the latter had no brow-ridges, it is extremely probable that the Swanscombe skull was also without them. The most obvious difference between the two skulls is that Piltdown has a much higher vault, which, if taken alone, would indicate a higher stage of evolution. But Piltdown man, about which so much has been written, is a most unsatisfactory fossil. All are familiar with its main features. Several portions of the brain-case were found, and, not far away, part of a lower jaw and a large canine tooth. If the skull had been found alone, it would have been called Homo sapiens; while if the jaw had been found alone, it would have been attributed to an anthropoid ape, akin

to the chimpanzee: but because they were lying near one another, most English authorities assume that they belong to the same animal. Many foreign anatomists, on the other hand, are convinced that the jaw is that of an ape; and recently Mr. Marston has given powerful arguments against its being human. The main argument for connecting the jaw with the skull is the extreme improbability of finding two such rarities as a human skull and an ape's jaw so near together. But improbably things do happen, and this argument is not wholly convincing.

When the Piltdown jaw is compared with that of a chimpanzee, we find that in both there is a bar of bone running across at the back of the chin, which is called the "simian shelf"; it is very characteristic of the apes, but is not present in any known human jaw, recent or fossil; and it therefore presents a strong argument against the humanity of the Piltdown jaw. The huge canine tooth evidently ground against its fellow in the upper jaw, as in the apes, and therefore there must have been a gap or "diastema" between the canines and their neighbours. This is also an anthropoid feature, but as it is occasionally seen in modern man, as well as in a fossil form which we shall study later, it is not so convincing. The peculiarities of the teeth I cannot deal with.

But the age of Piltdown man is also in dispute. Sir Arthur Woodward and many others regard it as Lower Pleistocene, but the gravel in which it lay is almost certainly Middle Pleistocene, and it may be of the same age. This view is strengthened by the resemblance between it and the Swanscombe skull, about the age of which there can be no doubt whatever. But if the Piltdown skull is really Lower Pleistocene, then the Swanscombe skull, which is almost, if not quite, Homo sapiens, is the only human bone which, up to the present, we can confidently assign to the Middle Pleistocene. We may put its age at about 250,000 years.

We will now go another step backwards, to the Lower Pleistocene; and there, unless we accept the Piltdown skull, the only human bone in Europe which certainly belongs to this period is the "Heidelberg jaw". It is a very massive bone, showing many points of similarity to Neanderthal man, of which its owner may have been an early forerunner: but we require more evidence on that point. Dr. Leakey claims to have found Homo sapiens in the Lower Pleistocene of Africa; but there is some doubt as to the exact horizon to which his skulls belong, so we must leave them out until we have further information. For more knowledge of the men of the Lower Pleistocene we must go to the other side of the world, to China and Java.

In 1892 Dr. Dubois found in a river deposit in Java the top of a skull, and a thigh bone; and to these he gave the name "Pithecanthropus erectus"; but we may call it simply "Java Man." For the next forty years controversy raged as to whether the skull was human, or belonged to a gigantic gibbon. The

thigh bone was unquestionably human, but there was no proof that it and the skull belonged to the same animal. But that controversy has now been entirely set at rest by the finding of another skull of the same species, more perfect, and unquestionably human. It has a great bar of bone across the forehead, and an extremely low vault to the cranium. But before we discuss further details of Java man, we had better examine the bones of a closely allied species found in China. In a cave near Peking, fourteen fairly complete skulls have been discovered, as well as a number of teeth and fragments of bone; but limb bones are very rare. This Peking Man was named Sinanthropus pekinensis, but further examination makes it clear that it and Java Man should be placed in the same genus. It is very fortunate that we have the remains of so many individuals, for they vary widely, and the finding of only one of the extreme forms would have given a wrong impression of the species as a whole. They had the same heavy bar across the forehead, and the same runaway chin as in Neanderthal man, but the jaw was not like that of Piltdown and there was no simian shelf. The teeth are primitive in some ways, but much more human than anthropoid; and although the canine teeth are fairly large, there is no gap or diastema between them and their neighbours such as we saw in Piltdown.

But the most conspicuous feature in which both Peking and Java men differed from Neanderthal or modern men is the small size of the brain. If we fill a skull with small shot or seeds, and then empty the shot or seeds into a measuring glass, we can measure the size of the brain, or the "Cranial Capacity", as it is called. Here are some measurements, expressed in cubic centimetres (c.c.). In all cases there is wide variation, but the average for a modern European is about 1400 c.c.; and of women about 1300 c.c.; Neanderthal about 1400 to 1600 c.c.; Java Man 835-1015 c.c.; Peking Man 850-1220 c.c.; Apes (Chimpanzee and Gorilla) 290-610, average about 400 c.c. The size of a man's brain is not an accurate guide to his intelligence, but from the extremely small measurements of these Java and Peking men, it is reasonable to infer that they fell far below modern intellectual standards; yet they made stone tools with a fair amount of skill; they hunted and killed animals (especially deer), and they knew the use of fire. They were therefore already far above the apes, as their cranial capacity indicates. This use of fire is particularly interesting in the light of some recent discoveries by Dr. Leakey in East Africa. He has found some sites where Acheulean man lived, and where he has left behind a number of stone tools and the bones of animals that he had killed; yet he found no trace of fire, although these men lived in the Middle Pleistocene, many thousands of years later than Peking men.

Now we will go back to Java where two important finds have been made in the last few years by a German anthropologist, von Koenigswald. In 1939 he obtained a brain-case and an upper

jaw, closely similar to Java man, but decidedly bigger. The brain-case is said to have the thickest walls of any skull yet discovered. But the main interest lies in the jaw, because, besides its immense size, it had a large canine tooth and a gap between it and the incisor. Weidenreich, who describes the specimen, claims this as unique in human skulls, but Darwin says it sometimes occurs in Kaffirs. However that may be, Weidenreich regards it as a new species of man, and calls it "Pithecanthropus robustus".

In 1943 von Koenigswald found part of a lower jaw, with three teeth, which was larger than Pithecanthropus robustus, and larger even than a gorilla; yet in general it was closely similar to Java man, both in the bone and the teeth: but its owner must have been a giant, as is indicated by its name Meganthropus, or "Big Man". Some years earlier some teeth of enormous size had been bought in a druggist's shop in China, for the Chinese value fossil teeth for medicinal purposes. These were named by Koenigswald Gigantopithecus, but Weidenreich declares that they are human, and from their gigantic size, the man who owned them seems to have been at least twice the size of a gorilla. Weidenreich interprets these facts as indicating that Peking and Java men were descended from a race of giants. He regards Gigantopithecus as the oldest, and then we go down in a descending series through Meganthropus and Pithecanthropus robustus, to Java man, about the same size as ourselves. That is a bold theory, but it seems to rest on a very small foundation. It is only fair to say that Weidenreich admits that these giants may be only varieties of a single race, all belonging to about the same period. But there is one possibility that he has overlooked: granted that his giants had teeth of human form, it does not necessarily follow that they really belonged to men; for in South Africa, as we shall see, there was a race of apes with teeth scarcely distinguishable from those of man.

Three fossil apes have been found near Krugersdorp, in South Africa. The Taungs skull, which was discovered in 1924, is that of a very young animal still retaining its milk teeth. The other two were found by Dr. Broom in the same region within the last ten years, one at Sterkfontein, and the other at Kromdraii. They are all undoubtedly apes, but quite unlike any living ape, and all were nearer to man than to the modern anthropoids in the form and arrangements of their teeth, as well as in other more technical details. The bones of the arm are so exactly like those of man as to show that they were not tree climbers (indeed they lived in a treeless district), and to suggest strongly that they walked upright; and, according to Dr. Broom, this is borne out by the leg bones; but the latter are so imperfectly known as to leave room for doubt on this point.

Paranthropus, the Kromdraii ape, was slightly smaller than a gorilla, but its brain was bigger, being estimated at 650 c.c.,

whereas the largest gorilla's brain is only 610 c.c., and most are decidedly less. The canine teeth are small and resemble those of man, with no diastema; and the other teeth, though very large, are also more human than anthropoid; indeed in the Sterkfontein ape they are said to be "almost typically human". And there are other important features. In man, owing to the way the jaw is fitted to the skull, the molar teeth are worn evenly across the crowns; whereas in apes, with a different joint, they wear more on the outer side. Here again the South African apes resemble man. Then again the arrangement of the teeth is different. In apes the palate has the shape of the letter U, curved in front, but with the lines of the premolars and molars running parallel: in man on the other hand, the form is that of a horseshoe and the lines of the large teeth diverge as we pass backwards. Here again the South African apes follow man. The milk teeth also are human in form; and this is important, because these teeth are more primitive than the permanent ones, and therefore suggest that the ancestors of man and of these apes separated off from the anthropoid stock at a very early period. What that period was, will be considered later. Dr. Broom points out that the second upper molar tooth of the Sterkfontein skull, which is twice the size of a human molar, very closely resembles, though on a smaller scale, the corresponding tooth of Gigantopithecus; and he concludes that the latter was not human at all, but belonged to the same family as these South African apes. But on that point we require more information.

None of these South African apes are very old, the oldest being of Upper Pliocene age, and they are therefore not old enough to be ancestors of man. But because they have so far only been found at this level, it does not follow that they originated then. They may well be remnants of a family which belonged to an earlier period, and perhaps had a wider range. Africa is notorious for such survivals; we have, for example, the Okapi, whose near relatives lived in Europe in the Miocene, but died out there, and have only left this one successor. There is also Deinotherium, a kind of elephant with curved tusks in the lower jaw, which lived in Europe and Africa in the Miocene, and was long supposed to have died out then; but it is now known that it survived in Africa into the Pleistocene, and was contemporary with man. It is quite possible, therefore, that the South African apes, with their peculiar human features, and their probable upright attitude, are survivals of a Pliocene or even earlier family. By the same reasoning the Java and Peking men may have originated before the Lower Pleistocene in which they are found; in fact they must have done so if Dr. Leakey is right in saying that Homo sapiens existed in Africa at that time: for Homo sapiens must mark a much later stage of evolution.

Another fossil ape, recently discovered in Africa, may also be close to the line of human evolution. In 1943 Dr. Leakey

found in Kenya, in Lower Miocene beds, the jaw of an ape which had been previously named "Proconsul", under the impression that it was a kind of chimpanzee; but Dr. Leakey's more perfect specimen shows it to be unlike any living ape; and in the "Illustrated London News" (August 24th, 1946) he describes and figures it. In some respects it came nearer to man than to existing apes; for it had no simian shelf—that ridge of bone behind the chin which we see in the apes, as well as in the Piltdown jaw; secondly the jaw was articulated to the skull as in man, and so the teeth wore down evenly; and thirdly the two lines of molar teeth diverge backwards as in man, instead of being parallel, as in apes. On the other hand the molar teeth are ape-like, and the canines are large, and separated from their neighbours by a diastema. But its many points of resemblance to man lead Dr. Leakey to think that it is possibly "a Lower Miocene representative of the stock from which man eventually evolved". It is surprising, however, that he makes no mention at all of the South African apes, which show more human features than Proconsul.

The question of the geological period at which the early ancestors of man first branched off from the anthropoid stem has received many different answers; and seeing the very small amount of evidence available, it opens the door most attractively to those who love speculation. The group of fossil apes, of which Dryopithecus is the best known, continued on into the Pliocene, and some American authorities believe that they gave rise to man in the Lower Pliocene, or at earliest in the Upper Miocene. Dr. Broom at one time expressed the same opinion; but later, after a careful study of the teeth, and especially the milk teeth of his South African apes, he went to the opposite extreme, and pushed the separation right back into the Eocene. On the other hand Sir Arthur Keith, who was never much impressed by the Dryopithecus group, declared that none of the Miocene fossils came near to being man's ancestors, and as early as 1913 he drew up an ancestral tree, in which the separation of the two stems is placed in the Oligocene. With this Dr. Leakey agreed when he wrote "Adam's Ancestors", but in his account of Proconsul he changes over from the Oligocene to the Miocene. Dr. Weidenreich expresses the opinion that the Lower Miocene is the latest date for this separation.

We have therefore plenty of theories to choose from; we can put the separation in the Pliocene, Miocene, Oligocene, or even Eocene, and we shall have the satisfaction of knowing that whichever we choose, no one can prove that we are wrong.

But all these theories come from anatomists, who ignore the archæological evidence. Man is the only tool-making animal. Other animals use such tools as they find ready, but man alone deliberately shapes them to his use. If, therefore, we can find stones which show evidence of having been deliberately shaped,

we may fairly claim that we are dealing with the work of man. Unfortunately there are wide differences of opinion in interpreting this evidence. I have not space to go into the vexed question of Eoliths, and I will only draw your attention to some chipped flints, collected by the late Mr. Westlake, of Fordingbridge, in the Department of Cantal in the Auvergne. Owing to the war and Mr. Moir's death, his account of them has not been published: but in Sollas's "Ancient Hunters" you will find that, after a careful examination, Sollas himself admitted that they were probably the work of man, and he quotes Professor Henry Balfour as being unable to understand how they could possibly be the work of natural forces. That was exactly how they struck me when Mr. Moir showed me some shortly before the war. Yet they belong to the Upper Miocene, and are therefore several million years old.

In conclusion I will remind you that although the brain of Peking and Java men was much smaller than our own, it was still twice as big as a gorilla's; there is therefore a big gap in our knowledge, which is only indirectly filled by the South African apes. But it is clear that the human articulation of the jaw, and the general arrangement of the teeth were evolved while our ancestors were still in the ape stage; and this is almost certainly true also of the upright stance and the free use of the hands and arms.

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Obituary.

WILLIAM GEORGE AITCHESON ROBERTSON, M.D., D.Sc., D.Litt., F.R.S.E., F.R.C.P.E.

We were all deeply grieved to learn of the death on Nov. 18th, 1946, of Dr. Aitcheson Robertson, a Past-President of the B.N.S.S. The end was not unexpected, for we all knew that the lamp of life was slowly flickering to its close. He had been bedridden in a nursing home for more than a year, and it had become distressing to all his many friends to witness the gradual failure of his faculties.

Dr. Robertson was richly endowed with academic distinctions. He held the triple doctorates of Medicine, Science and Literature, which was surely almost a record. He was a Fellow of the Royal Society of Edinburgh and of the Royal College of Physicians of Edinburgh. He was for many years an extramural lecturer on Medical Jurisprudence at Edinburgh University.

Forty-six years have elapsed since I first met Dr. Robertson. I had just completed my first piece of research work, which dealt with the development of the retina. He was the Secretary of the Scottish Microscopical Society, and very kindly arranged for me to communicate to that Society the results of this investigation, which were subsequently published in their Proceedings. I did not see him again until my wife and I came to live in Bournemouth. We were soon enabled to count Dr. and Mrs. Robertson among our most intimate friends. We came to admire more and more his academic scholarship and his rare gift of quaint Scottish humour. His contributions to the B.N.S.S. demonstrated the wide range of his interests and his activities. He held bravely on in spite of increasing infirmity, and was still determined to fulfil his duty to the Society as a lecturer, even when it had become an effort to ascend the platform. We shall always remember his genial personality and the valuable contributions which he gave to the Proceedings of the Society.

JOHN CAMERON.

PRESENTED
13 MAY 1947